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Claim 26. (Amended) A surgical probe for treating benign prostatic hyperplasia (BPH), said probe comprising:

a waveguide having a tip with a glass cladding extending to a distal end of the tip, the waveguide for communicating electromagnetic radiation in a first propagation direction to the tip of the waveguide;

means for positioning the waveguide during surgery;

a transmitting surface on the tip of the waveguide;

a reflecting surface on the tip of the waveguide for internally reflecting electromagnetic radiation communicated in the first propagation direction by the waveguide in a second propagation direction toward the transmitting surface; and

wherein substantially all electromagnetic radiation reflected by the reflecting surface is incident on the transmitting surface at below a critical angle for transmission through the transmitting surface.

REMARKS

Claims 1 through 19, and 21 through 35 remain and are presented for examination. Claim 19 has been, with this response, been cancelled.

The present invention is an apparatus for communicating and laterally directing electromagnetic radiation including a waveguide with a tip, and a transmitting surface on the tip. A reflecting surface on the tip internally reflects electromagnetic radiation in a direction lateral to a propagation direction toward a particular area on the transmitting surface. The particular area has, in one embodiment, a reflecting surface disposed so that greater than about 90% of electromagnetic radiation reflected by the reflecting surface is incident on the particular area at below a critical angle for transmission through the transmitting surface in the lateral direction. The waveguide has a glass cladding

which extends all the way along the waveguide to the reflecting surface. The reflecting surface has an interface between an external medium and a bevelled end surface on the fiber core at a distal end of the tip. The transmitting surface includes a portion of the cylindrical outside surface of the core cladding.

Claims 7, 8, 19, 26 and 30 have been rejected under 35 U.S.C. 102(e). This ground of rejection is respectfully traversed.

Payne et al. fails to teach or suggest that the glass cladding extends to the end of the waveguide structure to the reflecting surface. Payne et al. does not teach or suggest that the fiber core and the core cladding extend to the end of the fiber. Instead, Payne et al. removes the fiber cladding and the buffer coating.

"The optical fiber 2 comprises a cylindrical fused silica core 3, a silicone resin fiber cladding 4, and a plastic buffer coating 5. The fiber cladding 4 and the buffer coating 5 are removed from the distal tip of the optical fiber 2 to expose approximately a 1.5 mm length of the core 3. (Emphasis added) Column 4, lines 26 through 31.

Significantly, Payne et al. removes the cladding and the buffer coating in order to expose a 1.5 mm length of the core. The present invention achieves significant results by not removing these layers from the core. Instead, they extend all the way to the end of the fiber, to the reflecting surface of the fiber. Claim 7 has been amended to clarify this point. Language has been added that the first and second widths extend to the reflecting surface. Claim 8, which depends from claim 7, also includes this clarification.

Claim 16, also depending from claim 7, includes this clarification. Additionally, claim 16 has further been clarified to recite that the transparent cap not only encloses the reflecting surface on the tip, but it also provides a turning of the angle of the reflected beam from its lateral direction. This is neither taught nor suggested by Payne et al.

Because claim 19 depends from claim 7, the further clarification of claim 7 is included in claim 19.

Claim 26 has also been amended to include clarifying language that the waveguide has a tip with a glass cladding that extends to a distal end of the tip. Again, Payne et al. teaches away from this extension of the glass cladding. Claim 30 depends from claim 26. The clarification of claim 26 also applied to claim 30.

Claims 16, 20 and 21 have been rejected under 35 U.S.C. 103 as being unpatentable over Payne et al. Claim 21 has been cancelled, therefore only discussions regarding claims 16 and 20 are pertinent.


As previously pointed out in the prior discussion of claim 16, it has been amended to clarify that the transparent cap not only protects the waveguide, but it also turns the deflect beam from its original lateral direction. In one embodiment, the transparent cap turns the beam 70 degrees when the waveguide is in an air medium. This is neither taught nor suggested by Payne et al.

Because claim 20 depends from claims 19, 8 and 7, the clarification of claim 7 is included in claim 20. It is submitted that claim 20 is, therefore, not obvious in view of Payne et al.

For the reasons recited above, it is believed that the claims, as currently presented, are patentable and should be advanced to allowance, which is earnestly solicited.

Respectfully submitted,

Date: 9/20/94

A handwritten signature in black ink, appearing to read "Paul Davis", is written over a horizontal line. The signature is stylized with a large, sweeping loop at the beginning.

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